

Week, I would like to call to the attention of my colleagues a most interesting editorial, read on Radio Station KSRA, Salmon, Idaho, by Mr. Dave Ainsworth, the station's owner and manager.

Mr. Ainsworth's remarks certainly speak for themselves and no embellishment is needed.

The editorial follows:

Good afternoon, friends, this is Constitution Week. It celebrates the signing on September 17, 1787, of the document which within the following 2 years was ratified by sufficient of the Original States to become effective on March 4, 1789.

It has been variously described. It has been called a charter of freedom—the world's greatest single document declaring the freedom of man—and more recently it has been described as obsolete, inadequate, outdated, and no longer pertinent to the times in which we live.

If this latter belief—held by too many who occupy positions of power and influence in our National Government—were true, I should feel like Brutus called upon for the funeral oration over the body of the slain Julius Caesar. William Shakespeare quoted Brutus as saying, "Friends, Romans, countrymen, lend me your ears. I come here to bury Caesar, not to praise him."

I sometimes feel that any remarks made about the Constitution in the context of many of today's attitudes are almost in the nature of some sort of requiem for a document that is either dead or dying.

Before we go on to discuss some ideas in this connection, let's look at another important document—important in the history of this Nation and in the history of the world. The Declaration of Independence was adopted by the Continental Congress a little more than 11 years before the Constitution was approved.

In its preamble, the Declaration of Independence actually becomes the parent of the Constitution, because it is in the Preamble of the Declaration that the principles of freedom—the theorem that "all men are created equal, that they are endowed by their Creator with certain unalienable rights, that among these are life, liberty, and the pursuit of happiness," was first expounded in this country, perhaps in the world. Another important line from that Preamble is a definition of government as it relates to the citizenry—important, as we think of the Constitution and today's attitudes toward it. The Declaration makes this statement, "That to secure these rights, governments are instituted among men, deriving their just powers from the consent of the governed." An important word to remember as we continue this discussion. The word is "consent"—the active kind of agreement, and not "assent," the passive variety. Ask yourself the question, are we consenting to what is being done to us, or have we turned into a government by assent?

But to go on with the Declaration itself. Beyond the Preamble, which is certainly best known, the Declaration is a step by step description of the colonial complaints against the government of King George the Third.

Some of the complaints are interesting. For instance, the Declaration complains that "he has refused to pass other laws for the accommodation of large districts of people unless these people would relinquish the right of representation in the legislature, a right inestimable to them and formidable to tyrants only."

Further, "He has made judges dependent on his will alone for the tenure of their offices, and the amount and payment of their salaries."

Further, "He has erected a multitude of new offices, and sent hither swarms of officers to harass our people and eat their substance."

These are but a few of the complaints of the Declaration, but they were some of the things which were considered when the Constitution was written 10 years later.

To get on with the Constitution itself—you know its basic form, starting with the lucid Preamble which sets the stage for all that follows.

Its words are immortal: "We, the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defense, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution of the United States of America."

It then proceeds to establish the three branches of the Government—the legislative branch with its duties well defined, the executive with its powers clearly established, and the judicial with its powers well delineated.

As established by the Constitution, these were to be three independent branches, each serving as a check on the other. Ask yourself what has happened in the last 30-some years to the system of checks and balances which were supposed to exist in the three branches of the Government. For instance, in the delineation of the duties of the President, the Constitution says that he shall "from time to time give to the Congress information on the state of the Union and recommend to their consideration such measures as he shall judge necessary and expedient." No place do I find any suggestion that he shall browbeat the Congress, both by the financial pressure now in his power and by the most flagrant of lobbying methods, to force through legislation which Members of the Congress know is wrong and not in accord with the wishes of their constituents.

This is merely a preface to discussion of a belief held by many that the Constitution as we know it—the Constitution as it was drawn by the Founding Fathers of this Nation—is being steadily eroded and destroyed by the very people who swear that they will defend the instrument by which they hold their offices and upon which this great Nation was founded.

What kind of a government is it? What kind of a government is established by the Constitution? Does it describe the United States as a democracy? No.

Over a period of a number of years, we have been brainwashed into the idea that this is a democracy—it is not.

There is a quote of a conversation between Benjamin Franklin and a lady friend, shortly after the Constitution was adopted. She is said to have asked, "and what kind of a government have you given us, Mr. Franklin?" His answer, "We have given you a federated Republic, and I hope you will be able to keep it."

This requires a couple of definitions and a quote from the Constitution.

First, the dictionary definition of a democracy: "A government by the people; a government in which the supreme power is retained by the people and exercised either directly (absolute or pure democracy) or indirectly (representative democracy) through a system of representation."

Then, the definition of a republic: "A state in which the sovereign power resides in a certain body of the people (the electorate) and is exercised by representatives elected by and responsible to them."

Then the quote from the Constitution itself—section 4 of article 4 of the Constitution says in part: "The United States shall guarantee to every State a republican form of government."

Note, nothing is said about a democracy, pure, absolute or indirect, but rather a group of republican form of government in which the electorate of the individual States shall be supreme, is guaranteed. Does this sound much like some of the recent Supreme Court

decisions, or some of the recent actions of Congress?

The President, the Members of the Congress, the members of all the courts, Supreme or inferior, are sworn to defend the Constitution. It provides for the offices they hold, but they are the very ones who are doing their best to destroy the efficacy of this instrument which is the lifeblood of the Nation.

The attitude of the current crop of intellectuals toward the Constitution is an enigma. Under the Constitution—and when we check history we find that during the first 120 years of this Nation's history it was followed fairly close and was not too severely tampered with, either by amendment of judicial decisions, the United States, in a few short years as history is measured, became the world's greatest nation.

But now, many say that document is outmoded. The drive today among the intellectuals who hold sway in Washington is toward the pure democracy. It has never worked in the world, and it never will. The theory of one man, one vote as pronounced by the Supreme Court in its decision on reapportionment of State legislatures and in civil rights matters is a denial of reason and a denial of the very document which establishes the Court.

The only thing that made acceptance of the Constitution possible in its formative stages was the great compromise in which the smaller States, both in area and population, insisted that at least one House of the National Legislature be apportioned equally among the States regardless of size or population. This is a basic element of the Constitution. And yet, the Supreme Court has held that when this same principle is applied in the States, it is unconstitutional.

I was taught in school that things equal to the same thing are equal to each other. Hence, if it is unconstitutional in the State, it is unconstitutional at the National level. Carry it one step further—and is the Supreme Court, in holding the Constitution unconstitutional, declaring itself out of existence? A good question and one the Justices might like to answer.

There is no place in the Constitution as written in which I find a declaration that citizenship conveys the right to vote. The States are guaranteed a republican form of government which infers that the States shall have the right to say who shall be qualified voters—to establish the electorate to which the government of the State and incidentally the Nation is responsible.

A federated republic, in which a group of states joined together in a constitution for their general welfare and protection can live if its citizens are willing to make the effort and the sacrifices to make it live.

Either a pure or representative democracy in which one man has one vote, regardless of his capabilities, his intelligence, his knowledge, his literacy, becomes mob rule. A nation cannot and will not live under democracy. It may continue to exist, but it will not long exist as a democracy. It changes from a democracy to a demagogery, because uneducated people, illiterate people, people too lazy to think for themselves, people all too willing to accept interpreted, rather than objective news, are led by those who promise the most.

How did it happen? That's easy to tell. The federated Republic established by the Constitution started on the skids in 1909, and the skids were thoroughly greased in 1913 when the 16th amendment establishing direct collection of the income tax was passed. Up to that time, the provision of the Constitution contained in paragraph 4, section 9, article I, said—and the Founding Fathers were smart—"no capitation or other direct tax shall be laid." It was only after this provision was stricken that the Federal Government could become the great pennies from heaven institution it now is.

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Another great error along the way brought about today's staggering bureaucratic monster. This will probably be challenged violently, because before the civil service was established, the old so-called spoils system prevailed. The elected officials appointed all Government officials right down the line, and there were some pretty sorry messes. But, when the political cry arose, "Throw the rascals out," it was possible.

Today, it isn't. You may sit back complacently and think that this is an elective government—that it is the men you elect who actually run things. Think again. What about that hard core of civil service employees—more than 2 million of them—the experts, the background people, the policymakers. The face may change, but the heart and pulse of every Federal agency is in the hands of the continuing civil service. This was never contemplated by the drawers of the Constitution.

A third, but not least, blow to constitutional government, also is connected to the establishment of this monolithic bureaucracy. The Congress has gone far beyond the bounds of the Constitution, which delegates to it the job of making the laws, and has given to each of this multiplicity of bureaus the right to make its own rules and regulations which take the effect of law. So, again, we have seen the erosion of the theoretical system of a federated republic.

And today we are moving further and further in the direction of a representative one-man, one-vote democracy, unsanctioned by the very instrument we are supposed to revere—a government more and more controlled by the executive branch, in which the checks and balances of the Constitution are being thrown into the discard.

Who is to blame?

Read the Constitution yourself. Study it. You can read as well as the next person, and you don't have to be a constitutional lawyer to understand its meaning. The men who wrote it were common men like you and me—not men steeped in the dream of power but, rather, men devoted to the idea that they could found a government in which schemers for power could not prevail. The road to pure democracy is the road to the destruction of the freedoms we have known, and our forefathers have prized. But that seems to be the way the firm of Johnson, HUMPHREY, Warren, and company want it.

And there's only one defense. It's the Congress of the United States. The Congress—in Senate and House of Representatives—is the one body that has the power to halt this mad dash. Will they do it? Only if the electorate comes to the realization that it must elect representatives who will not be led further down the path of governmental expediency.

Listen to this and think about it. It was said in 1778 by General St. Clair, a commander in the Continental Army, and almost 10 years before the Constitution was written. Of course, he was referring to the then Continental Congress, but what he said rings true today. We quote:

"Should some future Congress depart for the great business of watching over the affairs of a whole continent, to hunt down an individual—should factions arise among them, and local interests take the place of the general interest—should their time be wasted in frivolous and endless disputes, whilst the public service stands still, and its honest servants are tired out with tedious and expensive waiting—should they create offices with great salaries, where those who hold them may rob the public without a possibility of detection, and cabal among themselves for the disposal of them—should they pass resolves ridiculous in themselves, and impossible to be carried into execution—then will Congress sink into contempt, nor

will all the importance they may endeavor to assume, nor the fastidious pomp they may display, support them; and then will the misfortune of America begin."

And that's the way it seems to me today.

## A Lasting Payments Remedy

### EXTENSION OF REMARKS

OF

HON. JAMES D. MARTIN

OF ALABAMA

IN THE HOUSE OF REPRESENTATIVES

Tuesday, September 21, 1965

Mr. MARTIN of Alabama. Mr. Speaker, under permission to extend my remarks in the RECORD I would like to include a very fine editorial on the need for a lasting remedy to our balance-of-payments problem. This editorial appeared in the Birmingham, Ala., Post-Herald on September 20, 1965:

#### A LASTING PAYMENTS REMEDY

A Republican study group has correctly remarked that the administration's present programs to bring some balance into our international payments account "have not gotten at the basic causes" of past deficits. The GOP also correctly termed voluntary controls over foreign investing and lending as "artificial, expedient and ultimately self-defeating."

To some degree, even partisan Democrats agree with this view. To their credit they insist, publicly at least that current efforts are indeed "voluntary" and "temporary." But to date there is no evidence the administration is coming to grips with more permanent and desirable solutions.

Reaching decisions in this area is no easy task, politically or economically. Tough and even unpopular measures will be necessary. But however difficult the task, the critical issue must be resolved if the dollar is to remain the cornerstone of free world monetary systems and if, as the administration desires, a decisive meeting can be held on monetary reform and implementation.

For their part, the Republicans suggest three approaches: Cutting foreign aid spending to trim dollar losses, increasing interest rates at home to attract more foreign capital, and reducing the number of troops stationed abroad—particularly in Western Europe.

All have merit, but the troop-reducing proposal could achieve the largest permanent saving. Actually not too much can be saved by cutting foreign aid expenditures because now more than 80 percent of aid money is spent in the United States. But there can and should be dollar savings in this field.

The interest rate proposal also would be of limited value since any substantial increases in the United States almost certainly would be followed by similar actions abroad. But a modest increase might well be tried, not only to lure a little more money from abroad but also to dampen inflationary fires at home.

The troop-reduction proposal involves security plans for the Western alliance. But here obviously is the place to work if we're to achieve real results on our payments problem. As Senator SYMINGTON, Democrat, of Missouri, asked this week: Is it still necessary to maintain five U.S. Army divisions in Europe? And as the Missouri Senator remarked, the United States would not be faced with its present payments problem if "now prosperous" European allies, once recipients of U.S. aid, had been more willing

to pay for the mutual defense and help of the underdeveloped nations.

As is apparent, the payments problem is a tough one and to achieve improvement of any permanency will require tougher action than has been taken. Our Government should get moving, or it may find itself as a last resort forced to do something no politician wants to contemplate—curbing travel abroad by U.S. citizens.

## Red Influence Up in the Dominican Republic

### EXTENSION OF REMARKS

OF

HON. WILLIAM C. CRAMER

OF FLORIDA

IN THE HOUSE OF REPRESENTATIVES

Tuesday, September 7, 1965

Mr. CRAMER. Mr. Speaker, on September 7, I took the floor of this body and warned that the Dominican Republic could become a Latin America Laos.

At that time, I pointed out that the Communist-led rebels are stronger than ever before, that the Communists controlled the rebel military organization in that country, and that they have been elevated to a position of dignity by becoming a partner in the provisional government in the Dominican Republic. I also said:

They (the Dominican rebels) are certain to use this position from which to launch an intensive campaign to take over the Dominican Republic and to abort the election process supposedly guaranteed.

In an article in today's press by Scripps-Howard Staff Writer R. H. Boyce, it is reported that the Communist-led rebels are now trying to prevent presidential elections scheduled for next May and further, that the Communists influence in the rebel camp is on the increase.

This report, and others of a similar nature, substantiates my belief that this whole matter of Communist subversion in this hemisphere be investigated by the Congress. In addition, I renew my demands that U.S. troops be retained in the Dominican Republic until we are certain that the country will not be taken over by the Communists and that short-of-war action against the real cancer in this hemisphere, Communist Cuba, be instituted. Such action would include the recognition of a non-Communist Cuban government in exile, a meaningful trade ban, and a halt to the flow of Communist trainees and arms between Cuba and other Latin American nations as well as Africa.

Following is the above referred to article which appeared in the September 24 issue of the Washington Daily News: [From the Washington (D.C.) Daily News, Sept. 24, 1965]

#### RED INFLUENCE UP IN DOMINICAN REPUBLIC—SPREADING PROPAGANDA AND TERROR

(By R. H. Boyce)

Communist and leftist influence in the Dominican Republic has increased since fighting ended and a provisional government

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was established, informed sources said here today.

More than 2,000 leftist agitators, men who were trained in the rebel enclave in downtown Santo Domingo while sporadic fighting was still going on, have now fanned out throughout the interior of the island. They spread propaganda and terror. They use the Communists' clenched fist salute.

One or two interior cities already have been affected, and there is danger of more of this. Officials try to keep the agitators under surveillance, but that's an almost impossible job.

#### CASTRO

The leftist 14th of June Revolutionary Movement, linked to Fidel Castro, reportedly plans to establish a guerrilla base near but not in some interior town. From this base, guerrilla bands could conduct terror and agitation raids throughout the surrounding countryside. The movement's hope is to prevent presidential elections scheduled for next May, or to insure that leftist candidates will win.

Some of the 58 Communists and leftist activists whose names the U.S. Government made public last April still are in the rebel enclave. Rebel radio broadcasts—much of it strongly anti-American in tone—continues daily. Rebel newspapers are still being published. These activities are expected to end once the rebel zone is completely dismantled. That will take another 10 days to 2 weeks, sources say.

"Communist influence in the rebel camp is much greater and more open now after 5 months," said one source.

Communists and pro-Communists have infiltrated labor unions, women's clubs, lawyers' and doctors' organizations, and teacher associations.

They continue to emphasize, especially to peasants in the interior, the "valorous" role of rebel soldiers who, "though outnumbered, continued to hold off the Dominican Regular Army, the vaunted United States 82d Airborne Division, and the inter-American peace force, too."

This kind of distortion and overdramatizing of the facts appeals to the Latin sense of masculinity and builds sympathy for the rebel cause.

Ousted President Juan Bosch is expected to return from exile in Puerto Rico tomorrow. It is believed he deliberately delayed his return so that an impressive welcome demonstration could be arranged.

This is partly to build enthusiasm for his expected presidential candidacy in next May's elections. But there is another factor: Sr. Bosch lost much public support when he failed to return to Santo Domingo during the bitter fighting. He hopes newly aroused feeling for him will overcome that loss.

### Latin American Anger Brings Reaction on Hill

#### EXTENSION OF REMARKS OF

**HON. DONALD J. IRWIN**

OF CONNECTICUT

IN THE HOUSE OF REPRESENTATIVES

Wednesday, September 22, 1965

Mr. IRWIN. Mr. Speaker, here it is just 4 days since passage of House Resolution 560 and already the folly of the State Department's action—or is it inaction—has become clear.

On Monday, before House consideration of the resolution involving the right

of one nation to intervene in any other nation where there is a Communist threat, I warned the State Department of the effect of this measure in Latin America.

I told Department officials that unless they made their feelings clear to Members of Congress the resolution would win overwhelming approval, and the result would be a damaging blow to our efforts to retain goodwill in Latin America.

But the State Department equivocated. Department officials indicated they were not happy with the resolution, but in the same breath remarked they would not oppose it.

The consequences of the State Department's decision is becoming more apparent every day. The latest proof of this is a story in today's Washington Post telling how our image has become tarnished in Latin America.

The article follows:

#### LATIN AMERICAN ANGER BRINGS REACTION ON HILL

(By John M. Goshko)

Administration efforts to affirm goodwill toward Latin America are being swamped in a flood of Latin anger over a House of Representatives resolution approving the use of force in any American nation threatened by a Communist takeover.

As of last night, the Congresses of two Latin countries—Peru and Colombia—had passed unanimous resolutions of their own denouncing the House action.

And the press and political sector in the rest of Latin America have started to produce anti-American criticism more intense than anything since the U.S. intervention in the Dominican Republic last April.

#### CLARIFICATION ASKED

So intense has been the outcry that Senator Jacob K. JAVITS, Republican, of New York, rose in the Senate yesterday to appeal for clarification of the confusion "about what our policy now really is toward Latin America."

On Monday, after almost no discussion, the resolution passed the House by an overwhelming vote. It says that any hemispheric country is justified in unilateral use of force to combat Communist subversion. Before passage the State Department expressed neither approval nor dissent.

The resolution merely expresses the feeling of the House and is not binding on administration policy. However, the Latins seem to regard it as an invitation to ignore the provisions in the Organization of American States Charter forbidding intervention in the internal affairs of any member state.

#### CONFERENCE MAY BE DELAYED

For this reason, several Latin governments already have suggested privately that the Inter-American Conference of Foreign Ministers, unofficially expected to begin in November, be put off until next March. Otherwise, these governments have warned, the Conference probably will bog down in anti-U.S. recrimination.

If the postponement takes place, it would mark an ironic ending to a month that the administration had earmarked as a time for reemphasizing hemispheric solidarity.

To this end, the administration staged a glittering White House reception and a major speech by President Johnson to mark the fourth anniversary of the Alliance for Progress. Mr. Johnson also sent Jack Hood Vaughn, Assistant Secretary of State for Inter-American Affairs, on a whirlwind goodwill tour of Latin America.

Things began coming apart 2 weeks ago,

however, when Senator J. WILLIAM FULBRIGHT, chairman of the Senate Foreign Relations Committee, delivered his attack on the Santo Domingo intervention. Then, in the midst of the controversy surrounding FULBRIGHT's speech, the House pushed through the resolution sponsored by Representative ARMISTEAD I. SELDEN, Jr., Democrat, of Alabama, chairman of its Inter-American Affairs Subcommittee.

Yesterday, as reports from almost every Latin capital told of rising anger, the subject continued to occupy the attention of U.S. Congressmen.

JAVITS criticized the House resolution as "particularly unfortunate" and said that if U.S. policy was as stated in the resolution, it would justify criticism that Washington is opposed to progressive forces in Latin America.

The New York Republican called for clarification of the U.S. stance through a Senate resolution that would reaffirm the faith of Congress in the Alliance for Progress as "the framework for nonviolent but accelerated social and economic development of Latin America."

In the House, however, SELDEN continued to press the view of the congressional faction concerned about communism in the hemisphere. In a lengthy speech, he defended the administration against FULBRIGHT's attack and echoed charges that a background document published by FULBRIGHT's committee was compiled primarily from press sources hostile to U.S. actions in Santo Domingo.

While this battling went on, the administration continued to maintain its almost total silence about the resolution. The State Department's only comment has been to say it agrees with the aims but feels that the wording is open to unfortunate interpretations.

What some of these interpretations are was made clear by yesterday's reports from Latin America. The resolution passed by the Peruvian Parliament called the House action "American imperialism in hemisphere affairs," while that adopted in Colombia described it as "openly regressive and contrary to the juridical political system of Latin America."

### Diffusion and Air Pollution

#### EXTENSION OF REMARKS

OF

**HON. GEORGE E. BROWN, JR.**

OF CALIFORNIA

IN THE HOUSE OF REPRESENTATIVES

Friday, September 24, 1965

Mr. BROWN of California. Mr. Speaker, in view of the fact that we have taken action on the amendments to the Clean Air Act today, I would like to call the attention of my colleagues to the remarks made by Prof. M. Neiburger at a meeting of the American Meteorological Society on October 14, 1964.

Under unanimous consent I include in the RECORD at this point the pertinent portion of this speech, which was published in Bulletin of the American Meteorological Society, volume 46, No. 3, March 1965, pages 131-134.

Professor Neiburger, who is in the Department of Meteorology, University of California at Los Angeles, is very concerned with the buildup of contaminants in the atmosphere. He presents some very thought-provoking views and pro-

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posals to which I commend your attention. The article follows:

# DIFFUSION AND AIR POLLUTION

(By M. Neiburger)

## DEFICIENCIES OF PREVIOUS RESEARCH

To get down to cases, then, let me say that most of the studies carried out heretofore with respect to diffusion have relatively little relevance to air pollution. The theoretical studies have been concerned (with some exceptions) with ideal situations which are sufficiently simple to be solved, at least approximately, and the experimental investigations have been carried out in situations which approximate the idealizations as nearly as possible in order to test the theory.

Perhaps I should interrupt myself long enough to explain to the ladies and other nonspecialists just what is meant by atmospheric diffusion. In the old days when people took cream in their coffee it was simple to illustrate from their daily experience. If poured into the coffee very slowly and not stirred the cream would remain where it was poured a long time, and only slowly mix with the dark brown brew. Stirring with a spoon creates an irregular motion we call mechanical turbulence which speeds up the horizontal and vertical spread of the cream and its rapid mingling with the coffee to form a uniform mixture. This spread and mixing is the process known as diffusion. If the cream were poured first and then the coffee the tendency of the light cream to rise to the top and the heavy coffee to sink would create convection which would further tend to mix the two, even in the absence of mechanical stirring. In this case we speak of the stratification as unstable, whereas when the heavier fluid is at the bottom we say it is stable. The degree of stability and the amount of mechanical turbulence are the factors which determine the rate of diffusion in the atmosphere.

Research studies of turbulent diffusion in the atmosphere have been concerned for the most part with the case where there is a steady wind blowing over smooth terrain under neutral conditions of stability, with the magnitude of turbulent fluctuations only a small fraction of the average wind. There are good reasons, of course, for attempting to develop a theory for this simplest case and testing it experimentally before proceeding to the more complex real situation. I do not mean to minimize the importance of such attempts, nor their difficulty. But in the actual situations which produce high concentrations of air pollution the average wind speed is only a little different from zero, with the turbulent variations as large as the mean wind, with buildings, hills, trees, and even moving elements such as vehicular traffic in place of the smooth ground assumed in the theory, and with inversions varying in intensity and thickness. Until the theory treats the case of light variable winds, irregular terrain, and strong but variable stability it will have little applicability to atmospheric pollution.

Secondly, most of the theoretical and experimental studies have dealt with single point sources, either instantaneous or continuous and constant, or line sources. But for the air pollution problems of current interest, those of cities, industrial complexes, and even megalopolises, it is necessary to deal with multiple sources or area sources with intensities varying in space and time. Some small starts have been made in investigating this type of source. One of its special characteristics is the fact that for area sources one is interested not only in the concentrations of pollutants at a distance, but more particularly at points within the source area.

A third complication is the fact that the pollutants undergo changes after they have

been emitted. The effect of gravitational settling out of particulates has been taken into account in some studies, but I know of none which take into consideration the chemical and photochemical reactions in which the gaseous contaminants participate as they diffuse in the atmosphere. For the determination of the concentrations of toxic substances it is clear that the reactions which produce them must be considered.

To treat simultaneously all these complications: light and unsteady wind and temperature structure, irregular terrain, multiple and area sources of variable intensity, and chemical reactions as the pollutants diffuse, is indeed a forbidding prospect, and it is not surprising or blameworthy that the investigators until now have not faced it. But before we can say that we know how to predict the pollution intensities we will have to do so.

Finally, with respect to the problems of diffusion air pollution, we must have studies of the ways in which pollutants are removed from the atmosphere (apart from the absorption in our lungs and other tissues), and the rate at which they go on. While diffusion continuously dilutes the concentration of contaminants, there must be processes which finally remove them; otherwise the background level of pollution of "pure" air would gradually rise. We do not actually know to what extent the background of particulate and gaseous contaminants is increasing, except possibly with respect to carbon dioxide. It would be very desirable to establish benchmark average values in places remote from sources for use in the future to determine at what rate the background levels are changing, if any. And it would be very desirable that the mechanisms of atmospheric cleansing be studied.

What is the value of this increased knowledge of the real processes of diffusion, transformation, and removal of pollutants in the atmosphere? The knowledge itself will not reduce the concentration of pollutants, of course, nor do I think that it will point to ways of altering the diffusion or removal process once the pollutants are in the atmosphere. I have on occasion examined various proposals for weather modification to accomplish these purposes in Los Angeles, and besides undesirable side effects the procedures proposed would require tremendous expenditures of energy, comparable with all the power produced in the United States. What the understanding I am advocating will do is enable the estimation of the effects increases in sources will have, either due to the continuous increase in population and the accompanying increase in pollution emitted per person as civilization progresses, or because of construction of particular industrial installations or shifts of population. Likewise it will enable estimation of the effects of control measures introduced to reduce or eliminate sources. To know how dangerous the untrammelled growth of population and industrialization may be, or how desirable any particular control measure may be, we must be able to make these estimates. The greater the danger, or the more expensive the control measure, the more worthwhile it is to have the meteorological knowledge which enables us to estimate their effects.

## TWO VISIONS OF THE FUTURE

I turn now to the speculation about the future. Looking into my smoggy crystal ball I see alternately two visions of the future—let us say the year 2064, one pessimistic and disheartening, the other optimistic, hopeful, and probably unrealistic.

The pessimistic view is that in the course of the next century, as the population grows, as the power demands per capita increase both in the already industrialized nations and in the developing countries where there is so much need for it, the amount of waste

poured into the atmosphere by these activities will far exceed its capacity to diffuse and to remove it, and the atmosphere will grow progressively more polluted until, a century from now, it is too toxic to permit human life. All civilization will pass away, not from a sudden cataclysm, but from the gradual suffocation by its own effluents.

Such a prospect is not pleasant to face, and so we shall not face it and do something about it, but instead will let it creep up on us, and only when it has progressed to the point where it will be extremely difficult and expensive to take any steps to combat it will the public be aroused to demand that something be done. And even then people will be unwilling to have any of their own activities curtailed or to have their own taxes increased to pay for the effort to prevent the disaster. Mankind will sink into its smoggy doom through inertia and irresponsibility.

The prospect is unpleasant for me to face as well, and while I am prepared to say to you 100 years from now "I told you so," I turn hastily to the more pleasant prospect of my other vision.

This view of the future is based on the unlikely premise that humans will at some time in the near future take stock of their relationship to the natural resources on which the very existence of human life and civilization is based. When the human species was young there was no need for concern: the resources available seemed boundless, and the only problem was to find ways to exploit them. As human population increases exponentially and as the per capita utilization of resources goes up even more rapidly, it becomes evident that there are bounds to the supply, not only of raw materials for luxuries but of food for life's very sustenance. While the increasing demand for food places other requirements on meteorologists, in terms of climate control, it does not threaten the air resources the way the power demands do if they are to be satisfied by combustion of fossil fuels.

To illustrate the consequences of unrestricted use of fossil fuels, just imagine the smog which would accumulate in the atmosphere if every one of the 800 million Chinese drove a gasoline-powered automobile, as every Los Angeleno does. And, of course, as the living standards of the developing countries rise, we may well expect that all Chinese, Indians, Africans, etc., will demand to have the same freedom of mobility that we Americans have.

I do not believe that it will be possible to devise controls for internal combustion engines which will reduce the noxious effluents adequately. What is required is a radical new approach to the problem of motive power for transportation, and my optimistic hope is that humanity will recognize the need and take the drastic steps required before it is too late.

A conceivable alternative, for instance, might be an electric powered automobile. Thus one can visualize a battery pack of the size of the gasoline tank in present automobiles, such that a single charge would provide adequate power to propel a car at reasonable speeds, say up to 60 miles per hour, for a distance comparable to that which a tankful of gasoline presently carries a car. One would be able to drive into a service station every 200 miles (say) and have the battery pack replaced by a freshly charged one, paying for the cost of the charging of the battery plus a part of its depreciation. The battery pack would completely take the place of the gas tank; its replacement when discharged would correspond to filling the tank. From the operational viewpoint the electric car would then be equivalent to the gasoline or diesel automobile, and if the premise of adequate power and speed were satisfied the users would be too. And from the pollution standpoint the burning of fossil (or nuclear) fuel